

REMARKS

Claims 1-27 were present in the application as filed. The present amendment cancels claims 6, 8, 13, and 22-27, thus, upon entry of the present amendment, claims 1-5, 7, 9-12, and 14-21 are pending.

The Office Action objects to the Abstract as filed, which was three paragraphs in length. Applicants are amending the Abstract to a single paragraph, and are requesting withdrawal of the objection to the Abstract.

The Office Action rejects claim 1 under 35 U.S.C. § 112, second paragraph, noting that structural relationships between a vision unit, a haptic unit, a control unit, a graphic user interface, and a holding pipette are omitted, such omission leaving the Examiner unsure whether the smart pipette or the micromanipulation device is the claimed invention.

Present claim 1 recites several subunits that comprise a smart pipette. Applicants submit that present claim 1 sets forth the necessary structural relations between the several subunits. Accordingly, Applicants are requesting that the § 112 rejection of claim 1 be reconsidered and withdrawn.

The Office Action rejects claims 1-2, 5-9, 11, and 13-16 under § 103(a) as being unpatentable over JP 11-347971 to Itiogawa ("Itiogawa") in view of U.S. Pat. No. 6,251,658 to Henderson et al. ("Henderson") and Fung, et al., *Internet-Based Remote Sensing and Manipulation in Micro Environment* (2001), ("Fung").

In forming the § 103 rejection, the Office Action acknowledges the deficiency of Itiogawa, i.e. that Itiogawa does not teach, in pertinent part, a smart pipette comprising: an orientation adjusting unit that changes orientation of a bio-cell whose location has been fixed by the holding pipette; and a sensor unit that obtains force/torque information concerning the bio-cell and the smart pipette at the time of the bio-cell manipulation.

Present claim 1 provides, in pertinent part, a holding pipette which fixes a location of a bio-cell; and an orientation adjusting unit **formed on the injection pipette**, which contacts the bio-cell and changes orientation of the bio-cell using friction with the bio-cell. The Office Action has not shown that Itiogawa discloses, or suggests, an orientation adjusting unit formed on the injection pipette, as required by present claim 1.

Further, in constructing the § 103 rejection the Office Action cites Henderson for, among other things, curing the acknowledged deficiency of Itiogawa. Particularly, the Office Action points out that "since the tip of the micropipette may be pre-positioned the [micro]manipulator [21] is capable of changing the orientation of the bio-cell." However, consulting FIG. 2 of Henderson, Applicants note that its micromanipulator 21, is not formed on the micropipette 11 (i.e. injection pipette). Rather, micromanipulator 21 appears simply to be a way for actuating movement of any suitable member attached thereto.

In contradistinction, the injection pipette of present claim 1 requires that an orientation-adjusting unit be formed on the injection pipette. Applicants therefore respectfully submit that Itiogawa and Henderson, taken either singly or in the cited combination, do not disclose or suggest all features of present claim 1. Applicants note further that the Office Action does not cite Fung, for indeed it cannot, for the proposition that Fung supplies the orientation adjusting unit of present claim 1. Accordingly, Applicants submit that present claim 1 defines patentably over not only Itiogawa and Henderson, but also over Fung, and any combination thereof. Reconsideration and withdrawal of the § 103 rejection of claim 1, and passage of claim 1 to allowance, are respectfully solicited.

Claims 2, 5, 7, 9 and 14-16 depend from claim 1. For at least the reason of such dependence, Applicants submit that these claims, like claim 1, define patentably over the cited art. Reconsideration and withdrawal of the § 103 rejection of these claims, and passage of these claims to allowance, are respectfully solicited. Claims 6, 8, and 13 are canceled, and therefore the § 103 rejection thereof is moot.

The Office Action rejects claims 17-27 under § 103(a) as being unpatentable over Fung in view of Henderson.

The Office Action asserts that Fung teaches a method comprising the steps of (i) quantifying force/torque information acquired through the sensor unit during bio-cell manipulation; (ii) transmitting the quantified force/torque information to a GUI; and (iii) manipulating the micro-tip based upon the force/torque information transmitted in step (ii).

The method of present claim 17 comprises the steps of: (a) fixing the location of a bio-cell; (b) changing the orientation of the bio-cell using friction between the bio-cell and an orientation adjusting unit formed on an injection pipette; (c) manipulating the bio-cell using the injection pipette; (d) quantifying force/torque information acquired through a sensor unit during said step of manipulating; (e) transmitting the quantified force/torque information to a graphic user interface; and (f) manipulating the bio-cell based upon the force/torque information transmitted in said step (e).

The Office Action's citation of Fung reveals that Fung is deficient in that Fung neither discloses nor suggests necessary steps a, b, and c of present claim 17. In forming the § 103 rejection, the Office Action cites Fung in combination with Henderson. However, the Office Action does not proffer the noted combination of art to cure the deficiency of Fung with regard to the aforesaid steps a, b, and c. Rather, the Office Action introduces Henderson for the proposition that Henderson teaches the use of a micro-pipette for inject biological cells using micromanipulators. Henderson is silent as to the steps of (a) fixing the location of a bio-cell; (b) changing the orientation of the bio-cell using friction between the bio-cell and an orientation adjusting unit formed on an injection pipette; and (c) manipulating the bio-cell using the injection pipette.

Applicants submit, therefore, that Fung and Henderson, taken either singly or the cited combination, do not disclose or suggest each element of present claim 17. Accordingly, Applicants

are requesting that the § 103 rejection of claim 17 be reconsidered and withdrawn, and that claim 17 be passed to allowance.

Claims 18-21 depend from claim 17. For at least the reason of such dependence, Applicants submit that these claims, like claim 17, define patentably over the cited art. Reconsideration and withdrawal of the § 103 rejection of these claims, and passage of these claims to allowance, are respectfully solicited. Claims 22-27 are canceled, thus rendering the § 103 rejection thereof moot.

The Office Action rejects claims 3-4, and 12 under § 103 as being unpatentable over Itiogawa, Henderson, and Fung, as applied to claim 1, and further in view of U.S. Pat. App. Pub. 2003/0180965 to Yobas et al. ("Yobas").

As discussed above with respect to claim 1, from which claims 3-4 and 12 depend, the cited combination of Itiogawa, Henderson, and Fung does not disclose or suggest all elements of claim 1. Regarding claim 3, the Office Action cites Yobas for the proposition that Yobas teaches a micropipette made from the biocompatible polymer PDMS. Applicants submit that Yobas does not supply, however, an element of claim 1 that the combination of Itiogawa, Henderson, and Fung does not supply. Accordingly, Applicants submit that claim 3 defines patentably over the cited combination of Itiogawa, Henderson, Fung, and Yobas. Applicants are requesting reconsideration and withdrawal of the § 103 rejection of claim 3, and passage of claim 3 to allowance.

Regarding claim 4, the Office Action cites Yobas for the proposition that Yobas teaches a micropipette made from the biocompatible polymer PDMS, suitable for a living body. Applicants submit that Yobas does not supply an element of claim 1 (particularly, an orientation adjusting unit formed on the injection pipette) that the combination of Itiogawa, Henderson, and Fung does not supply. Accordingly, Applicants submit that claim 4 defines patentably over the cited combination of Itiogawa, Henderson, Fung, and Yobas. Applicants are requesting reconsideration and withdrawal of the § 103 rejection of claim 4, and passage of claim 4 to allowance.

Regarding claim 12, the Office Action cites Yobas for the proposition that Yobas teaches a micropipette made from the biocompatible polymer PDMS. Even if Yobas teaches such a micropipette, Applicants submit that nevertheless Yobas does not supply an element of claim 1 (particularly, an orientation adjusting unit formed on the injection pipette) that the combination of Itiogawa, Henderson, and Fung does not supply. Accordingly, Applicants submit that Yobas does not cure the joint deficiency of Itiogawa, Henderson, and Fung, and thus claim 12 defines patentably over the cited combination of Itiogawa, Henderson, Fung, and Yobas. Applicants are requesting reconsideration and withdrawal of the § 103 rejection of claim 12, and passage of claim 12 to allowance.

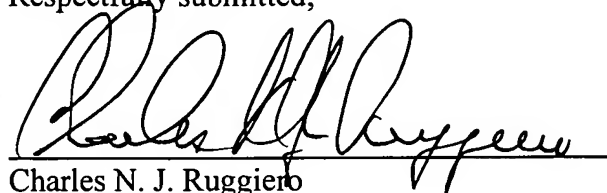
Claim 10 is rejected under § 103(a) as being unpatentable over Itiogawa, Henderson, Fung, and Fung, et al., *A 2-D PVDF Force Sensing System for Micro manipulation and Micro-assembly*, 2002 ("Fung II"). In proffering the § 103 rejection of claim 10, the Office Action admits, first, that claim 10 depends on claim 1 such that the reasoning used to reject claim 1 is relied upon to reject the dependent portions of claim 10; and second admits that Itiogawa does not teach a cantilever-type sensor unit.

As discussed above with regard to claim 1, Applicants submit that the cited combination of Itiogawa, Henderson, and Fung has failed to teach or suggest each element of claim 1, from which claim 10 depends. In forming the § 103 rejection of claim 10, the Office Action relies on Fung II for the proposition that Fung II teaches a cantilever-type sensor unit. Even assuming, *arguendo*, that Fung II teaches such a sensor, it nevertheless has not been shown that Fung II cures the deficiency left by the combination of Itiogawa, Henderson, and Fung as applied to claim 1.

Applicants therefore submit that claim 10 defines patentably over the cited combination of Itiogawa, Henderson, Fung, and Fung II. Applicants are requesting reconsideration and withdrawal of the § 103 rejection of claim 10, and are requesting passage of claim 10 to allowance.

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Respectfully submitted,



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